Towards Vivid and Diverse Image Colorization with Generative Color Prior

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Abstract

Colorization has attracted increasing interest in recent years. Classic reference-based methods usually rely on external color images for plausible results. A large image database or online search engine is inevitably required for retrieving such exemplars. Recent deep-learning-based methods could automatically colorize images at a low cost. However, unsatisfactory artifacts and incoherent colors are always accompanied. In this work, we aim at recovering vivid colors by leveraging the rich and diverse color priors encapsulated in a pretrained Generative Adversarial Networks (GAN). Specifically, we first "retrieve" matched features (similar to exemplars) via a GAN encoder and then incorporate these features into the colorization process with feature modulations. Thanks to the powerful generative color prior and delicate designs, our method could produce vivid colors with a single forward pass. Moreover, it is highly convenient to obtain diverse results by modifying GAN latent codes. Our method also inherits the merit of interpretable controls of GANs and could attain controllable and smooth transitions by walking through GAN latent space. Extensive experiments and user studies demonstrate that our method achieves superior performance than previous works.